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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/774,614	07/07/2004	Patrick Bernard	Q79773	1667
23373 7590 08/06/2007 SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037			EXAMINER ALEJANDRO, RAYMOND	
			ART UNIT 1745	PAPER NUMBER
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/774,614

Applicant(s)

BERNARD ET AL.

Examiner

Raymond Alejandro

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07/07/04 and 11/22/04.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 02/10/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Priority***

1. Acknowledgment is made of applicant's claim for priority under 35 U.S.C. 119(a)-(d) based upon an application filed in France on 02/11/03. A claim for priority under 35 U.S.C. 119(a)-(d) cannot be based on said application, since the United States application was filed more than twelve months thereafter. Effective filing date of the present application is July, 07, 2004, and foreign application from which applicant claims foreign priority was filed on February 02, 2003. Accordingly, the claim for foreign priority has not been granted.
2. Additionally, it is further noted that no certified copy of the 0301586 application as required by 35 U.S.C. 119(b) is present in the file.

### ***Information Disclosure Statement***

3. The information disclosure statement (IDS) submitted on 02/10/04 was considered by the examiner.
4. The information disclosure statement filed 11/22/04 fails to comply with 37 CFR 1.98(a)(1), which requires the following: (1) a list of all patents, publications, applications, or other information submitted for consideration by the Office; (2) U.S. patents and U.S. patent application publications listed in a section separately from citations of other documents; (3) the application number of the application in which the information disclosure statement is being submitted on each page of the list; (4) a column that provides a blank space next to each document to be considered, for the examiner's initials; and (5) a heading that clearly indicates that the list is an information disclosure statement. The information disclosure statement has

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been placed in the application file, but the information referred to therein has not been considered.

### ***Drawings***

5. The drawings were received on 02/10/04. These drawings are acceptable.

### ***Specification***

6. The substitute specification filed 11/22/04 has been entered because it does conform to 37 CFR 1.125(b) and (c). The preliminary amendment of 11/22/04 does not generate new matter.
7. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.
8. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. *It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," "The present invention provides" etc.*

### ***Claim Rejections - 35 USC § 112***

9. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

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10. Claims 1-18 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The general formula of the styrene-acrylate copolymer recited in claim 1 includes undefined molar amounts p, q and x. No specific representation or value of the foregoing molar amounts is substantively claimed, or disclosed or described in the as-filed disclosure so as to reasonably enable one skilled in the art to use or make the claimed styrene-acrylate copolymer. At most, assuming arguendo that a copolymer of styrene-acrylate is intended and positively disclosed therein, molar amounts p, q and x can take the value of 1 as apparently intended in paragraphs 10-11, 32, 46, 62, 69, 77 and the likes.

11. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

12. Claims 1-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

13. Claim 1 is indefinite as it does not define the numerical range or value for molar amounts p, q and x in the general formula of the styrene-acrylate copolymer. The final intended styrene-acrylate copolymer is uncertain and unknown.

***Claim Rejections - 35 USC § 103***

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

16. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

17. Claims 1-6, 9-10 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawano et al 5824435 in view of German publication DE 19709107 (heretofore the DE'107).

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The present invention is directed to a secondary electrochemical cell wherein the disclosed inventive concept comprises the specific binder.

As to claim 1:

Kawano et al disclose an alkaline storage cell comprising a non-sintered positive electrode (COL 1, lines 5-10/ COL 4, line 62 to COL 5, line 5/COL 1, lines 30-35) wherein an active material paste is formed by the use of a polymeric binder and an electrically conductive powder, then, the paste is coated on the electrode substrate (COL 1, lines 58-65/COL 2, lines 44-53/COL 4, lines 44-55/ CLAIM 1). Disclosed is that the substrate do not have a three-dimensional construction as in other electrodes (COL 1, lines 44-48). *Thus, it is a two-dimensional substrate.* Substrate is made of a punched metal plate or expanded metal plate (COL 1, lines 41-44), or a strip-like nickel plate (COL 3, lines 18-22). *Thus, it is conductive.*

As the polymeric binder, Kawano et al disclose that it is known to use carboxymethyl cellulose (CMC) and styrene-butadiene rubber (SBR) (COL 4, lines 45-55).

As to claims 2-3 and 5:

Kawano et al disclose specific amounts of the components forming the paste layer, for instance, disclosed is the use of 5 g of styrene-butadiene rubber (SBR) in a total amount of 170 g of all components forming the paste layer including nickel hydroxide (100 g), Co powder (10 g), the cellulose (55 g) and styrene-butadiene rubber (5 g) (COL 4, lines 44-55). *Thus, the weight % of Kawano et al's disclosed copolymer is approximately 2.94 % wt.*

With respect to the weight percent of the cellulose, as per the above constituents of Kawano et al's layer, the weight % of the cellulose compound is approximately 32.4 % wt.

As to claim 4:

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As the polymeric binder, Kawano et al disclose that it is known to use carboxymethyl cellulose (CMC) (COL 4, lines 45-55).

As to claim 6:

Kawano et al disclose the use of nickel hydroxide as electrochemical active material (COL 4, line 47/ COL 1, line 30-31).

As to claims 9-10:

Kawano et al disclose the use of Co powder (COL 4, line 47-50). *In this case, the Co powder is cobalt metal itself.*

As to claim 16:

Kawano et al disclose the use of a fabric of a polyamide resin combined together with the positive electrode (COL 4, lines 62-67). *Thus, it can be said that the layer contains polymer fibers as certain degree of interaction does occur at the interface between the active material layer of the electrode and the disclosed resin.*

As to claim 17:

Substrate is made of a punched metal plate or expanded metal plate (COL 1, lines 41-44), or a strip-like nickel plate (COL 3, lines 18-22).

Kawano et al disclose an alkaline cell as described hereinabove. However, the preceding reference fails to expressly disclose the specific copolymer containing the acrylate, the specific weight percent of cellulose compound and the metal-hydride anode.

As to claim 1:

The DE'107 discloses that it is known to use nickel metal hydride accumulators (batteries) containing alkaline electrolytes (ABSTRACT) wherein the electrode compositions



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contain an acrylate binder which is added as crosslinked dispersion and has a specific ester group (ABSTRACT).

As to claim 18:

The DE'107 discloses alkaline electrolyte cells containing metal hydride as the negative electrode (ABSTRACT).

In view of the above, it would have been obvious to a person possessing a level of ordinary skill in the pertinent art at the time invention was made to employ the acrylate polymer of the DE'107 in the binder of Kawano et al to make a copolymer base material containing styrene and acrylate as the DE'107 discloses that the use of acrylate-based binder materials improves gravimetric capacity of batteries. Thus, the DE'107 provides a direct teaching that acrylate-based binder materials has beneficial effects on batteries; additionally, this is consistent with Kawano et al's teaching that polymeric-based materials are used as binders in order to increase the force of bonding between the electrode substrate and the active material layer which is necessary in non-sintered electrodes.

With respect to the metal-hydride anode, it would have been obvious to a person possessing a level of ordinary skill in the pertinent art at the time invention was made to use the metal hydride anode of the DE'107 as the negative electrode of Kawano et al as the DE'107 disclose the suitability of using metal hydride anodes in Ni-based alkaline batteries due to their chemical compatibility and electrochemical reactivity for converting chemical energy into electrical energy. As such, the DE'107 discloses that it is well-known in the art to couple Ni-based positive electrodes with metal hydride negative electrode to form an electrochemical cell device capable of generating electrical energy.

As to the specific weight percent of cellulose compound, it would have been obvious to a skilled artisan at the time invention was made to employ the specific weight percent of the cellulose compound as instantly claimed or any other suitable amount thereof as Kawano et al themselves disclose that polymeric-based materials are used as binders in order to increase the force of bonding between the electrode substrate and the active material layer which is necessary in non-sintered electrodes; thus, Kawano et al recognize the specific weight percent of the cellulose compound binder as a variable that achieves a recognized result (*i.e. amount of cellulose compound binder sufficient to maintain the force of bonding between the electrode substrate and the active material layer*) *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). See also *Peterson*, 315 F.3d at 1330, 65 USPQ2d at 1382; and *In re Hoeschele*, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969). Generally speaking, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. “[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.” *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). Thus, it is prima-facie obvious to choose or select the specific amount of cellulose compound). See **MPEP 2144.05 Obviousness of Ranges**.

18. Claims 1-7, 9-13 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawano et al 5824435 in view of Bernard et al 2003/0152834.

The present invention is directed to a secondary electrochemical cell wherein the disclosed inventive concept comprises the specific binder.

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As to claim 1:

Kawano et al disclose an alkaline storage cell comprising a non-sintered positive electrode (COL 1, lines 5-10/ COL 4, line 62 to COL 5, line 5/COL 1, lines 30-35) wherein an active material paste is formed by the use of a polymeric binder and an electrically conductive powder, then, the paste is coated on the electrode substrate (COL 1, lines 58-65/COL 2, lines 44-53/COL 4, lines 44-55/ CLAIM 1). Disclosed is that the substrate do not have a three-dimensional construction as in other electrodes (COL 1, lines 44-48). *Thus, it is a two-dimensional substrate.* Substrate is made of a punched metal plate or expanded metal plate (COL 1, lines 41-44), or a strip-like nickel plate (COL 3, lines 18-22). *Thus, it is conductive.*

As the polymeric binder, Kawano et al disclose that it is known to use carboxymethyl cellulose (CMC) and styrene-butadiene rubber (SBR) (COL 4, lines 45-55).

As to claims 2-3 and 5:

Kawano et al disclose specific amounts of the components forming the paste layer, for instance, disclosed is the use of 5 g of styrene-butadiene rubber (SBR) in a total amount of 170 g of all components forming the paste layer including nickel hydroxide (100 g), Co powder (10 g), the cellulose (55 g) and styrene-butadiene rubber (5 g) (COL 4, lines 44-55). *Thus, the weight % of Kawano et al's disclosed copolymer is approximately 2.94 % wt.*

With respect to the weight percent of the cellulose, as per the above constituents of Kawano et al's layer, the weight % of the cellulose compound is approximately 32.4 % wt.

As to claim 4:

As the polymeric binder, Kawano et al disclose that it is known to use carboxymethyl cellulose (CMC) (COL 4, lines 45-55).

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As to claim 6:

Kawano et al disclose the use of nickel hydroxide as electrochemical active material (COL 4, line 47/ COL 1, line 30-31).

As to claims 9-10:

Kawano et al disclose the use of Co powder (COL 4, line 47-50). *In this case, the Co powder is cobalt metal itself.*

As to claim 16:

Kawano et al disclose the use of a fabric of a polyamide resin combined together with the positive electrode (COL 4, lines 62-67). *Thus, it can be said that the layer contains polymer fibers as certain degree of interaction does occur at the interface between the active material layer of the electrode and the disclosed resin.*

As to claim 17:

Substrate is made of a punched metal plate or expanded metal plate (COL 1, lines 41-44), or a strip-like nickel plate (COL 3, lines 18-22).

Kawano et al disclose an alkaline cell as described hereinabove. However, the preceding reference fails to expressly disclose the specific copolymer containing the styrene-acrylate copolymer, the specific weight percent of cellulose compound, the metal-hydride anode, and the specific additional hydroxide compounds and Y-based compound.

As to claim 1:

Bernard et al disclose secondary electrochemical cells (P0001) comprising alkaline electrolytes (P0021) wherein the electrode comprises a conductive support and a layer containing the active material and a binder (P0002, 0013) wherein the binder is preferably selected from the

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group consisting of styrene butadiene copolymer or styrene-acrylate copolymer (P0013/CLAIM 10).

As to claim 7:

Bernard et al that the positive electrode further contains hydroxide based on nickel, partially substituted by Co and/or Zn (P00014). *Thus, Benard et al readily envision the introduction of other hydroxide materials including Co-hydroxide and/or Zn-hydroxide.*

As to claims 11-13:

Bernard et al disclose the optional addition of a yttrium compound such as  $Y_2O_3$  (P0014).

As to claim 18:

The DE'107 discloses alkaline electrolyte cells containing metal hydride as the negative electrode (P0002).

In view of the above, it would have been obvious to a person possessing a level of ordinary skill in the pertinent art at the time invention was made to employ the acrylate polymer of the DE'107 in the binder of Kawano et al to make a copolymer base material containing styrene and acrylate as the DE'107 discloses that the use of acrylate-based binder materials improves gravimetric capacity of batteries. Thus, the DE'107 provides a direct teaching that acrylate-based binder materials has beneficial effects on batteries; additionally, this is consistent with Kawano et al's teaching that polymeric-based materials are used as binders in order to increase the force of bonding between the electrode substrate and the active material layer which is necessary in non-sintered electrodes.

With respect to the specific additional hydroxide compounds and Y-based compound, it would have been obvious to a person possessing a level of ordinary skill in the pertinent art at the

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time invention was made to use the specific additional hydroxide compounds and Y-based compound of Benard et al in the positive electrode of Kawano et al as Bernard et al disclose the foregoing hydroxide compounds and Y-based compound are additive for facilitating shaping of the electrode such as texture stabilizer or a thickener (P0013 & 0068).

With respect to the metal-hydride anode, it would have been obvious to a person possessing a level of ordinary skill in the pertinent art at the time invention was made to use the metal hydride anode of the DE'107 as the negative electrode of Kawano et al as the DE'107 disclose the suitability of using metal hydride anodes in Ni-based alkaline batteries due to their chemical compatibility and electrochemical reactivity for converting chemical energy into electrical energy. As such, the DE'107 discloses that it is well-known in the art to couple Ni-based positive electrodes with metal hydride negative electrode to form an electrochemical cell device capable of generating electrical energy.

As to the specific weight percent of cellulose compound, it would have been obvious to a skilled artisan at the time invention was made to employ the specific weight percent of the cellulose compound as instantly claimed or any other suitable amount thereof as Kawano et al themselves disclose that polymeric-based materials are used as binders in order to increase the force of bonding between the electrode substrate and the active material layer which is necessary in non-sintered electrodes; thus, Kawano et al recognize the specific weight percent of the cellulose compound binder as a variable that achieves a recognized result (*i.e. amount of cellulose compound binder sufficient to maintain the force of bonding between the electrode substrate and the active material layer*) *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). See also *Peterson*, 315 F.3d at 1330, 65 USPQ2d at 1382; and *In re Hoeschele*,

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*406 F.2d 1403, 160 USPQ 809 (CCPA 1969)*. Generally speaking, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. “[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.” *In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955)*. Thus, it is prima-facie obvious to choose or select the specific amount of cellulose compound). *See MPEP 2144.05 Obviousness of Ranges*.

19. Claims 1-6, 9-10 and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawano et al 5824435 in view of Vandayburg et al 6399246.

The present invention is directed to a secondary electrochemical cell wherein the disclosed inventive concept comprises the specific binder.

As to claim 1:

Kawano et al disclose an alkaline storage cell comprising a non-sintered positive electrode (COL 1, lines 5-10/ COL 4, line 62 to COL 5, line 5/COL 1, lines 30-35) wherein an active material paste is formed by the use of a polymeric binder and an electrically conductive powder, then, the paste is coated on the electrode substrate (COL 1, lines 58-65/COL 2, lines 44-53/COL 4, lines 44-55/ CLAIM 1). Disclosed is that the substrate do not have a three-dimensional construction as in other electrodes (COL 1, lines 44-48). *Thus, it is a two-dimensional substrate*. Substrate is made of a punched metal plate or expanded metal plate (COL 1, lines 41-44), or a strip-like nickel plate (COL 3, lines 18-22). *Thus, it is conductive*.

As the polymeric binder, Kawano et al disclose that it is known to use carboxymethyl cellulose (CMC) and styrene-butadiene rubber (SBR) (COL 4, lines 45-55).

As to claims 2-3 and 5:

Kawano et al disclose specific amounts of the components forming the paste layer, for instance, disclosed is the use of 5 g of styrene-butadiene rubber (SBR) in a total amount of 170 g of all components forming the paste layer including nickel hydroxide (100 g), Co powder (10 g), the cellulose (55 g) and styrene-butadiene rubber (5 g) (COL 4, lines 44-55). *Thus, the weight % of Kawano et al's disclosed copolymer is approximately 2.94 % wt.*

With respect to the weight percent of the cellulose, as per the above constituents of Kawano et al's layer, the weight % of the cellulose compound is approximately 32.4 % wt.

As to claim 4:

As the polymeric binder, Kawano et al disclose that it is known to use carboxymethyl cellulose (CMC) (COL 4, lines 45-55).

As to claim 6:

Kawano et al disclose the use of nickel hydroxide as electrochemical active material (COL 4, line 47/ COL 1, line 30-31).

As to claims 9-10:

Kawano et al disclose the use of Co powder (COL 4, line 47-50). *In this case, the Co powder is cobalt metal itself.*

As to claim 16:

Kawano et al disclose the use of a fabric of a polyamide resin combined together with the positive electrode (COL 4, lines 62-67). *Thus, it can be said that the layer contains polymer*



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*fibers as certain degree of interaction does occur at the interface between the active material layer of the electrode and the disclosed resin.*

As to claim 17:

Substrate is made of a punched metal plate or expanded metal plate (COL 1, lines 41-44), or a strip-like nickel plate (COL 3, lines 18-22).

Kawano et al disclose an alkaline cell as described hereinabove. However, the preceding reference fails to expressly disclose the specific styrene-acrylate copolymer and the specific weight percent of cellulose compound.

As to claim 1:

Vandayburg et al discloses a water soluble binder useful for preparing electrodes for either primary or secondary batteries, having either aqueous or non-aqueous electrolyte, containing a styrene-butadiene copolymer or a styrene-acrylate copolymer (ABSTRACT/COL 1, lines 9-22/COL 7, lines 38-42).

In view of the above, it would have been obvious to a person possessing a level of ordinary skill in the pertinent art at the time invention was made to employ a styrene-acrylate copolymer of Vandayburg et al in the binder of Kawano et al as Vandayburg et al discloses that such a binder eliminates or reduces the need for organic solvents during preparation of an electrode made of a particulate active electrode material; and the binder exhibits good chemical resistance, adhesive properties, flexibility and resilience, making it well-suited for use in preparing batteries (Abstract).

As to the specific weight percent of cellulose compound, it would have been obvious to a skilled artisan at the time invention was made to employ the specific weight percent of the

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cellulose compound as instantly claimed or any other suitable amount thereof as Kawano et al themselves disclose that polymeric-based materials are used as binders in order to increase the force of bonding between the electrode substrate and the active material layer which is necessary in non-sintered electrodes; thus, Kawano et al recognize the specific weight percent of the cellulose compound binder as a variable that achieves a recognized result (*i.e. amount of cellulose compound binder sufficient to maintain the force of bonding between the electrode substrate and the active material layer*) *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). See also *Peterson*, 315 F.3d at 1330, 65 USPQ2d at 1382; and *In re Hoeschele*, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969). Generally speaking, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. “[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.” *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). Thus, it is prima-facie obvious to choose or select the specific amount of cellulose compound). *See MPEP 2144.05 Obviousness of Ranges*.

20. Claims 7 and 11-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over: a) Kawano et al 5824435 in view of German publication DE 19709107 (heretofore the DE’107); b) Kawano et al 5824435 in view of Bernard et al 2003/0152834; and/or c) Kawano et al 5824435 in view of Vandayburg et al 6399246 as applied to claims 1 and 6 above, and further in view of Miyamoto et al 2005/0244712.

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The preceding prior art references are applied, argued and incorporated herein for the reasons manifested above. However, none of the preceding reference expressly disclose the specific hydroxide compounds and the specific Y-based or Yb-based compounds.

As to claim 7:

Miyamoto et al disclose a sealed nickel-based alkaline electrochemical cell (TITLE/ABSTRACT/P0039-0040) wherein Co-hydroxide or hydroxide based on nickel doped with Zn (*the hydroxide of an element such as Zn*) are added to the positive electrode material including nickel hydroxide (P0025-0026). Disclosed is that positive electrode active substances comprising these additives have quite excellent conductivity (P0025).

As to claims 11-15:

Miyamoto et al disclose a sealed nickel-based alkaline electrochemical cell (TITLE/ABSTRACT/P0039-0040) wherein the capacitance preserving ratio at the time of storage can be improved by adding compounds of Y and Yb to the positive electrode active substance comprising nickel hydroxide (P0027). Examples of those compounds are  $Y_2O_3$  and  $Yb_2O_3$  (P0027).

In view of the above, it would have been obvious to a person possessing a level of ordinary skill in the field of invention at the time invention was made to employ the specific hydroxide compounds of Miyamoto et al in the electrode material of the combined prior art references as set forth above as Miyamoto et al teach that positive electrode active substances comprising these additives have quite excellent conductivity (P0025).

With respect to the specific Y-based or Yb-based compounds, it would have been obvious to a person possessing a level of ordinary skill in the field of invention at the time

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invention was made to employ the specific Y-based or Yb-based compounds of Miyamoto et al in the electrode material of the combined prior art references as set forth above as Miyamoto et al teach that the capacitance preserving ratio at the time of storage can be improved by adding the specific compounds of Y and Yb to the positive electrode active substance comprising nickel hydroxide (P0027).

21. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawano et al 5824435 in view of German publication DE 19709107 (heretofore the DE'107) as applied to claims 1 and 6 above, and further in view of Takemura et al RE37935.

The preceding prior art references are applied, argued and incorporated herein for the reasons manifested above. However, none of the preceding reference expressly disclose the specific grain size of the nickel hydroxide.

Takemura et al disclose an alkaline storage cell like a nickel-cadmium storage cell (COL 1, lines 13-25) wherein nickel hydroxide having an average grain size of 1.5-200  $\mu\text{m}$  is used (COL 4, lines 21-30). Specifically, **EMBODIMENT 1** uses a nickel hydroxide whose grain shape is globe (*spheroidal shape*) with an average grain size of 10  $\mu\text{m}$  (COL 5, lines 40-50). Thus, **EMBODIMENT 1** shows the grain size of the nickel hydroxide with sufficient specificity.

In view of the above, it would have been obvious to a person possessing a level of ordinary skill in the field of invention at the time invention was made to employ the nickel hydroxide having specific grain size of Takemura et al in the electrode material of the combined prior art references as set forth above as Takemura et al teach that such a specific grain size is a suitable grain size for nickel hydroxide active materials because smaller grain sizes can be

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especially conspicuous as it interferes with the dissolution of the active material in the electrolyte and bigger grain sizes are not desirable because nickel hydroxide formed of so large grains is hard to add uniformly to the active material. Thus, the specific grain size of 10  $\mu\text{m}$  as embodied in **EMBODIMENT 1** is well within Takemura et al's disclosed grain size range and represents a desirable grain size exhibiting the beneficial effects disclosed by Takemura.

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (571) 272-1282. The examiner can normally be reached on Monday-Thursday (8:00 am - 6:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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